Audit Guidelines for the State of Arizona Department of Weights & Measures for Quality Audits of Registered Supplier and Independent Laboratories

(Issued 3/15/04)

Audit Information
Facility Name:
Date(s) of Audit:
Auditor's Name(s):
Period Under Review:

Audit Goals
1) Ensure that data and information reported to the State is accurate and valid.
2) Ensure that data representing fuel quality is prepared in a manner consistent with the Regulations under Article 7 of the Arizona Administrative Code.
3) Ensure that data submitted to State is representative and defensible.
4) Ensure compliance with requirements outlined in statute and regulation.

Audit Scope
As it applies to the registered supplier and independent laboratory for the period under audit, to verify that the Registered Supplier has complied or caused the independent laboratory to comply with the Regulations under Article 7 of the Arizona Administrative Code. The audit is done in order to determine if the fuel quality of the gasoline being delivered into Area A is being reported to the Arizona Department of Weights and Measures correctly.

Audit Guidelines
IN THE AUDIT OF REGISTERED SUPPLIERS AND INDEPENDENT LABORATORIES, THESE PROCEDURES SHOULD BE USED AS A GUIDE. THE AUDITOR SHOULD USE PROFESSIONAL JUDGEMENT IN DETERMINING THE APPLICABILITY OF EACH PROCEDURE LISTED. THESE PROCEDURES MAY REQUIRE MODIFICATION BASED ON THE FACTUAL CIRCUMSTANCES ENCOUNTERED DURING THE AUDIT. DEVIATIONS FROM THESE MINIMUM PROCEDURES REQUIRE APPROVAL FROM THE ARIZONA DEPARTMENT OF WEIGHTS AND MEASURES.

These Protocols are effective only on the day they were printed. Changes may occur at any time.

Audit Protocol

If the Registered Supplier has a QA/QC Plan (R20-2-752(E))	Completed	N/A
A. Preparation		
1. Review QA/QC Plan as submitted by the Registered Supplier		
2. Review any prior audit reports by DWM		
B. Laboratory Tour		
1. Assess adequacy of facility for required testing		
C. Review of Regulatory Requirements (in conjunction with Protocol)		
1. Verify that the in-use QA/QC Plan is the version approved by the DWM		
2. Verify that the laboratory is testing for regulated parameters using the methods listed in R20-2-759		
3. Verify that retain samples are being maintained in accordance with the provisions of the QA/QC Plan (minimum 30 days)		
4. Review actions taken in response to prior DWM audit findings		
5. If found, investigate any multiple testing of products that were at specification limits to insure that the resolution of the questions had the proper procedures followed		
D. Review of any audits conducted by internal auditors or independent third parties		
1. Review the findings of these audits		
2. Obtain and review documents in answer to these findings		
3. Verify that the laboratory is complying with the responses to the findings		
E. Review of Quality Assurance Performance		
1. For test methods listed in R20-2-759 and API gravity (or Density), review performance in ASTM RFG Crosscheck Program using a minimum of 6 months of data		
2. Review performance in any additional pertinent crosstest programs, if data is available		
3. In all crosstest programs reviewed, assess variability and bias for each test method		
F. Review of Quality Control Performance		
1. For each test method or each instrument used for testing a regulated parameter, review the current quality control chart, applying extra attention to those tests with indications of variability or bias based on the review of QA performance		
2. Assess variability and note any trends		
3. Verify that the frequency of SQC testing is in accordance with the		

frequency specified in the QA/QC Plan		

If the Registered Supplier has a QA/QC Plan (R20-2-752(E))	Completed	N/A
4. Review the Calibration and Maintenance records to verity that the instruments were properly calibrated and maintained during the review period		
G. Additional Activities (as time allows)		
1. Review maintenance and calibration logbooks		
2. Review Quality System documents		
a. review summaries of internal and external audits		
b. review Non-conformance files		
c. review minutes of quality system minutes		
3. Review Training Records		
4. Review Procedures		

Notes

Option 1 (100% Testing) – (R20-2-752(F(1)(a))	Completed	N/A
A. Preparation		
1. Obtain list of batches sampled within 45 days of the date of the audit		
2. Review any prior audit report by DWM		
At the Registered Supplier's facility:		
B. Laboratory Tour		
1. Assess adequacy of facility for required testing		
C. Review of Regulatory Requirements (in conjunction with Protocol)		
1. Verify registered Independent Laboratory was the laboratory used during the audit period		
2. Verify that the Registered Supplier and Independent Laboratory are operating in accordance with the provisions of R20-2-752(F)(1)		
3. Review batch files to verify that each batch has been sampled and tested by the Independent Laboratory		
4. Review actions taken in response to prior DWM audit findings		
At the Independent Laboratory facility:		
D. Laboratory Tour		
1. Assess adequacy of facility for required testing		
E. Review of Regulatory Requirements (in conjunction with Protocol)		
1. Verify that the laboratory is testing for regulated parameters using the methods listed in R20-2-759		
2. Verify that retain samples are being maintained in accordance with the provisions of R20-2-752(F)(3)(b) (minimum 45 days)		
3. Review actions taken in response to prior DWM audit findings		
F. Review of Quality Assurance Performance		
1. For test methods listed in R20-2-759 and API gravity (or Density), review performance in ASTM RFG Crosscheck Program using at least 6 months of data		
2. Review performance in any additional pertinent crosstest programs, if data is available		
3. In all crosstest program reviewed, assess variability and bias for each test method		

Option 1 (100% Testing) – (R20-2-752(F(1)(a))	Completed	N/A
G. Review of Quality Control Performance		
1. For each test method or each instrument used for testing a regulated parameter, review the current quality control chart, applying extra attention to those tests with indications of variability or bias based on the review of QA performance		
2. Assess variability and note any trends		
3. Verify that the frequency of SQC testing is in accordance with the frequency specified by internal quality procedures		
4. As applicable, crosscheck data point values from the charts against primary laboratory documents (e.g. logbooks, calibration records)		
H. Review of Tank Sampling Documents		
1. Review tank sampling documents to verify that information required in R20-2-752(F)(3)(a) is being recorded		
2. Note any discrepancies		
I. Observation of Test Methods		
1. At a minimum, observe testing procedures for D-1319 and D-5191		
2. Observe additional tests as necessary based on QA/QC performance review		
3. Note any deviations from test method requirements or deviations from internal procedures		
J. Comparative Testing		
1. Obtain retain sample for testing by DWM Contract Laboratory		
2. Arrange shipping or deliver sample to Contract Laboratory		
3. After receipt of results (usually after field audit is complete), compare test results to previous values reported to DWM		
4. Compare variance is J.3 (above) to the "splitting limits" in R20-2-752(H)(1), and note any properties in excess of those limits		
K. Inspection of Retain Room and Retain Samples		
1. Verify that all retain samples are being maintained in accordance with R20-2-752(F)(3)(b) (minimum 45 days)		
2. Inspect retain samples for fill level and assess sample integrity by checking tightness of caps		
3. Assess maintenance and orderliness of retain sample room		
4. Assess system used by independent laboratory to record, maintain and destroy retain samples		
L. Assess Manual Data Transfer Processes		
1. Verify accuracy of SQC test sample data transfer (see E. 4. above)		

Option 1 (100% Testing) – (R20-2-752(F(1)(a))	Completed	N/A
and/or;		
2. Verify the accuracy of AZ CBG or AZRBOB batch data transfer by comparing Batch Report values, laboratory Certificate of Analyses, and original laboratory data		
M. Review AZRBOB – Ethanol Blending Procedure		
N. Additional Activities (as time allows)		
1. Review maintenance and calibration logbooks		
2. Review Training Records		
3. Review Standard Operating Procedures (SOP's)		

Notes

Option 2 (10% Testing) - (R20-2-752(F)(1)(b))	Completed	N/A
A. Preparation		
1. Obtain list of batches sampled within 45 days of the date of the audit		
2. Review any prior audit report by DWM		
At the Registered Supplier's facility:		
B. Laboratory Tour		
1. Assess adequacy of facility for required testing		
C. Review of Regulatory Requirements (in conjunction with Protocol)		
1. Verify registered Independent Laboratory was the laboratory used during the audit period		
2. Verify that the Registered Supplier and Independent Laboratory are operating in accordance with the provisions of R20-2-752(F)(1)		
3. Review batch files to verify that each required batch was sampled by the Independent Laboratory		
4. Review actions taken in response to prior DWM audit findings		
D. Review of Quality Assurance Performance		
1. For test methods listed in R20-2-759 and API gravity (or Density), review performance in ASTM RFG Crosscheck Program using at least 6 months of data		
2. Review performance in any additional pertinent crosstest programs, if data is available		
3. In all crosstest programs reviewed, assess variability and bias for each test method		
E. Review of Quality Control Performance		
1. For each test method or each instrument used for testing a regulated parameter, review the current quality control chart, applying extra attention to those tests with indications of variability or bias based on the review of QA performance		
2. Assess variability and note any trends		
3. Verify that the frequency of SQC testing is in accordance with the frequency specified in the QA/QC Plan		
4. As applicable, crosscheck data point values from the charts against		

Option 2 (10% Testing) - (R20-2-752(F)(1)(b))	Completed	N/A
primary laboratory documents (e.g. logbooks, calibration records)		
F. Observation of Test Methods		
1. At a minimum observe testing procedures for D-1319 and D-5191		
2. Observe additional tests as necessary based on QA/QC performance review		
3. Note any deviations from test method requirements or deviations from internal procedures		
G. Assess Manual Data Transfer Processes		
1. Verify accuracy of SQC test sample data transfer (see E. 4. above)		
2. Verify the accuracy of AZ CBG or AZRBOB batch data transfer by comparing Batch Report values, laboratory Certificate of Analyses, and original laboratory data		
H. Review AZRBOB – Ethanol Blending Procedure		
I. Additional Activities (as time allows)		
1. Review maintenance and calibration logbooks.		
2. Review Training Records		
3. Review Standard Operating Procedures (SOP's)		
At the Independent Laboratory facility:		
J. Laboratory Tour		
1. Assess adequacy of facility for required testing		
K. Review of Regulatory Requirements (in conjunction with Protocol)		
1. Verify that the laboratory is testing for regulated parameters using the methods listed in R20-2-759		
2. Verify that retain samples are being maintained in accordance with the provisions of R20-2-752(F)(3)(b) (minimum 45 days)		
3. Compare number of batches sampled with number of batches tested during the audit period		
4. Review actions taken in response to prior DWM audit findings		
5. Review method used to select the 10% testing batches		
L. Review of Quality Assurance Performance		
1. For test methods listed in R20-2-759 and API gravity (or Density), review performance in ASTM RFG Crosscheck Program using at least 6 months of data		
2. Review performance in any additional pertinent crosstest programs, if data is available		

Option 2 (10% Testing) - (R20-2-752(F)(1)(b))	Completed	N/A
M. Review of Quality Control Performance		
1. For each test method or each instrument used for testing a regulated parameter, review the current quality control chart, applying extra attention to those tests with indications of variability or bias based on the review of QA performance		
2. Verify that the frequency of SQC testing is in accordance with the frequency specified by internal quality procedures		
N. Review of Tank Sampling Documents		
1. Review tank sampling documents to verify that information required in R20-2-752(F)(3)(a) is being recorded.		
2. Note any discrepancies		
O. Comparative Testing		
1. Obtain retain sample for testing by DWM Laboratory		
2. Arrange shipping or deliver sample to Contract Laboratory		
3. After receipt of results (usually after field audit is complete), compare test results to previous values reported to DWM		
4. Compare variance in J.3 (above) to the "splitting limits" in R20-2-752(H)(1), and note any properties in excess of those limits		
P. Inspection of Retain Room and Retain Samples		
1. Verify that all retain samples are being maintained in accordance with R20-2-752(F)(3)(b) (minimum 45 days)		
2. Inspect retain samples for fill level and assess sample integrity by checking tightness of caps		
3. Assess maintenance and orderliness of retain sample room		
4. Assess system used by independent laboratory to record, maintain and destroy retain samples		
Q. Assess Manual Data Transfer Processes		
1. Verify the accuracy of AZ CBG or AZRBOB batch data transfer by comparing Batch Report values, laboratory Certificate of Analyses, and original laboratory data		
R. Review AZRBOB – Ethanol Blending Procedure		
1. Verify that the procedure used by the Independent Laboratory is the same procedure used by the Registered Supplier		
2. Verify that the ETOH used by the Independent Laboratory is the same type (purity) ETOH used by the Register Supplier		

Notes

Audit Findings
Review the actions taken to complete each step of this protocol. Summarize your conclusions.
Review and discuss any unresolved compliance issues with appropriate facility personnel. Make notes of responses and explanations.
Make a list of these exceptions and discuss with other team members.
Evaluate the data used to substantiate the audit results.

Appendix 1
Allowable Differences between Independent Laboratory Results and Facility Laboratory Results

Fuel Property	Range	Unit of Measure
Sulfur content	25	Ppm by weight
Aromatics	2.7	% by volume
Olefins	2.5	% by volume
Ethanol	0.4	% by volume
Methanol	0.2	% by volume
MTBE	0.6	% by volume
ETBE	0.6	% by volume
TAME	0.6	% by volume
t-Butanol content	0.6	% by volume
RVP	0.3	Psi
T50	5	Degrees F
T90	5	Degrees F
E200	2.5	% by volume
E300	3.5	% by volume
API gravity	0.3	API

Appendix 2
Laboratory Methods under 13 CCR 2263

Fuel Property	Method
RVP	D-323 or 13 CCR 2297
Sulfur	D-2622 or D-5453
Benzene	D-5580
Olefins	D-1319
Oxygen	D-4815
T50	D-86
T90	D-86
Aromatics	D-5580
Ethanol	D-4815
MTBE	D-4815

* CARB required D-6550 after December 31, 2001. However, this is NOT an approved test method for Arizona CBG or AZRBOB.

Appendix 3
Laboratory Methods under 40 CFR 80.46(a) to (g)

Fuel Property	Method
Sulfur (gasoline)	D-2622
Sulfur (butane)	D-3246
Olefins	D-1319
RVP	40 CFR 80 Appendix E *
Distillation	D-86
Benzene	D-3606
Aromatics	GCMS **
Oxygen	GC-OFID ***
Ethanol	D-4815
MTBE	D-4815

* D-5191
** 40 CFR 80.46(f) or D-5769
*** 40 CFR 80.46(g) or D-5599